CHEMICAL ANALYSIS OF ORE TAILINGS REFERENCE MATERIALS

FINAL REPORT

BY

TECHNICAL SERVICE LABORATORIES

Work on this project was conducted under the auspices of the Department of Energy, Mines and Resources

DSS FILE NUMBER: 09SQ.23440-7-9166-2

DSS CONTRACT NUMBER: 23440-7-9166/02-SQ

SCIENTIFIC AUTHORITY: Dr. C.W. Smith

90-05654/1

TECHNICAL SERVICE LABORATORIES

DIVISION OF BURGENER TECHNICAL ENTERPRISES LIMITED

1301 FEWSTER DRIVE
MISSISSAUGA, ONTARIO
L4W 1A2
(416) 625-1544 FAX: (416) 625-8368

CERTIFICATE OF ANALYSIS

SAMPLE(S) FROM

Canmet - MSL Division
555 Booth Street
Ottawa, Ontario
K1A 0G1
Attn: Dr. C.W. Smith

REPORT No. T-4440

SAMPLE(S) OF

REFERENCE ORE TAILINGS

CANMET ORE	RTS-1 A	RTS-1 B	RTS-1 C	RTS-1 D	RTS-1 E	RTS-1 F
Si %	21.08	20.91	20.75	20.86	20.76	20.62
Fe %	20.14	20.38	20.44	20.55	20.51	20.62
Ca %	2.81	2.79	2.75	2.77	2.74	2.75
Mg %	2.67	2.68	2.67	2.68	2.67	2.67
Al %	4.40	4.40	4.36	4.39	4.33	4.33
S %	1.76	1.63	1.61	1.60	1.62	1.72
SO4 %	2.76	2.97	2.85	2.73	2.84	2.70
CO2%	0.65	0.73	0.66	0.65	0.59	0.90
Moisture %	2.57	2.68	2.69	2.63	2.66	2.62
Cu ppm	590	620	600	610	590	610
Pb ppm	90	110	95	110	100	105
Zn ppm	540	570	520	560	530	550
Cd ppm	<1	<1	<1	<1	<1	<1
Co ppm	13	14	15	14	14	15
Ni ppm	11	13	12	12	12	12
As ppm	10	10	10	10	9	8
Pt ppb	<10	<10	<10	<10	<10	<10
Pd ppb	1	1	4	4	5	4
Au ppb	300	282	318	345	336	345

April 20/88

SIGNED _____

CTA

For enquiries on this report, please contact Customer Service Department.
Samples, Pulps and Rejects discarded two months from the date of this report.

TECHNICAL SERVICE LABORATORIES
1301 FEWSTER DRIVE. MISSISSAUGA. ONTARIO L4W 1A2
TELEPHONE : (416) 625 - 1544

CERTIFICATE OF ANALYSIS

CANMET - MSL Division
555 BOOTH ST.
OTTAWA ONT.
K1A 0G1
YOUR REFERENCE- ATTN: C.W. SMITH

T.S.L. REPORT No. : T - 4440
T.S.L. File No. : 09FEB
T.S.L. Invoice No. :

SAMPLE #	SiO2 %	Al2O3 %	Fe2O3 %	CaO %	MgO %	Na2O %	K2O %	TiO2 %	MnO %	P2O5 %	Ba ppm	Sr ppm	Zr ppm	LOI	TOTAL
RTS1-A	45.13	8.32	28.80	3.94	4.43	.77	.66	.72	.26	.14	151	69	121	5.44	98.66
RTS1-B	44.76	8.32	29.15	3.91	4.45	.73	.56	.72	.26	.14	122	66	115	5.47	98.51
RTS1-C	44.42	8.23	29.22	3.85	4.43	.72	.60	.72	.26	.13	116	63	114	5.55	98.18
RTS1-D	44.65	8.30	29.08	3.88	4.44	.72	.50	.72	.26	.13	116	63	113	5.58	98.60
RTS1-E	44.43	8.18	29.32	3.84	4.42	.72	.61	.72	.26	.13	116	63	113	5.67	98.34
RTS1-F	44.13	8.18	29.49	3.85	4.43	.70	.55	.71	.26	.13	114	63	112	5.77	98.24

DATE : 08-FEB-1988

SIGNED : A.H. Debnam

Adrian H. Debnam Ph.D.

TECHNICAL SERVICE LABORATORIES

DIVISION OF BURGENER TECHNICAL ENTERPRISES LIMITED

1301 FEWSTER DRIVE
MISSISSAUGA, ONTARIO
L4W 1A2
(416) 625-1544 FAX: (416) 625-8368

CERTIFICATE OF ANALYSIS

SAMPLE(S) FROM

Canmet - MSL Division
555 Booth Street
Ottawa, Ontario
K1A 0G1
Attn: Dr. C.W. Smith

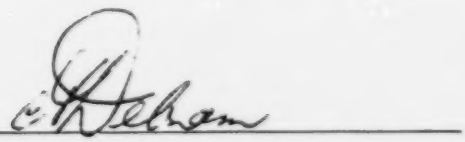
REPORT No. T-4441

SAMPLE(S) OF

REFERENCE ORE TAILINGS

CANMET ORE TAILINGS	RTS-2 A	RTS-2 B	RTS-2 C	RTS-2 D	RTS-2 E	RTS-2 F
Si %	3.22	3.19	3.17	3.15	3.28	3.21
Fe %	39.09	39.39	39.34	39.48	39.39	39.28
Ca %	0.55	0.53	0.52	0.52	0.57	0.54
Mg %	0.39	0.37	0.36	0.36	0.38	0.37
Al %	0.85	0.83	0.84	0.83	0.85	0.85
S %	15.92	16.94	16.35	16.15	16.65	16.51
SO4 %	1.26	1.08	1.23	1.26	1.25	1.29
CO2%	0.95	0.66	1.45	1.61	0.87	1.68
Moisture %	4.41	4.30	4.12	4.24	4.59	4.47
Cu ppm	390	400	390	400	400	380
Pb ppm	25	25	30	30	35	30
Zn ppm	100	110	90	100	90	100
Cd ppm	<1	<1	<1	<1	<1	<1
Co ppm	80	80	80	80	80	80
Ni ppm	2500	2600	2400	2600	2400	2600
As ppm	3	3	4	4	3	3
Pt ppb	300	300	70	250	310	220
Pd ppb	150	170	50	160	160	140
Au ppb	55	47	14	41	38	35

April 20/88

SIGNED 

CTA

For enquiries on this report, please contact Customer Service Department.
Samples, Pulps and Rejects discarded two months from the date of this report.

TECHNICAL SERVICE LABORATORIES
1301 FEWSTER DRIVE. MISSISSAUGA. ONTARIO L4W 1A2
TELEPHONE : (416) 625 - 1544

CERTIFICATE OF ANALYSIS

CANMET - MSL Division
555 BOOTH ST.
OTTAWA ONT.
K1A 0G1
YOUR REFERENCE- ATTN: C.W. SMITH

T.S.L. REPORT No. : T - 4441
T.S.L. File No. : 09FEB
T.S.L. Invoice No. :

SAMPLE #	SiO2 %	Al2O3 %	Fe2O3 %	CaO %	MgO %	Na2O %	K2O %	TiO2 %	MnO %	P2O5 %	Ba ppm	Sr ppm	Zr ppm	LOI	TOTAL
RTS2-A	6.90	1.60	55.89	.76	.65	.31	.14	.29	.06	.02	62	36	27	32.12	98.75
RTS2-B	6.84	1.58	56.31	.74	.62	.30	< .10	.29	.06	.02	60	35	21	32.25	99.09
RTS2-C	6.78	1.59	56.26	.72	.60	.29	< .10	.29	.06	.02	58	35	19	32.35	99.06
RTS2-D	6.73	1.57	56.46	.72	.60	.29	< .10	.28	.06	.01	57	35	27	32.31	99.14
RTS2-E	7.01	1.60	56.31	.80	.62	.36	.14	.29	.06	.02	62	39	22	32.29	99.51
RTS2-F	6.87	1.60	56.16	.75	.61	.31	.20	.27	.06	.02	73	37	32	32.44	99.30

DATE : 18-FEB-1988

SIGNED : Adrian H. Debnam Ph.D.

TECHNICAL SERVICE LABORATORIES

DIVISION OF BURGENER TECHNICAL ENTERPRISES LIMITED

1301 FEWSTER DRIVE
MISSISSAUGA, ONTARIO
L4W 1A2
(416) 625-1544 FAX: (416) 625-8368

CERTIFICATE OF ANALYSIS

SAMPLE(S) FROM

Canmet - MSL Division
555 Booth Street
Ottawa, Ontario
K1A 0G1
Attn: Dr. C.W. Smith

REPORT No.
T-4442

SAMPLE(S) OF

REFERENCE ORE TAILINGS

CANMET ORE TAILINGS	RTS-3 A	RTS-3 B	RTS-3 C	RTS-3 D	RTS-3 E	RTS-3 F
Si %	16.39	16.85	16.56	16.62	16.74	16.87
Fe %	23.11	22.46	22.62	22.67	22.76	22.46
Ca %	2.26	2.31	2.27	2.31	2.30	2.31
Mg %	2.45	2.52	2.47	2.50	2.50	2.53
Al %	4.88	5.04	4.94	5.02	4.98	5.07
S %	11.41	8.21	10.27	8.50	7.82	8.65
SO4 %	2.61	2.19	2.58	1.98	2.25	2.79
CO2%	0.88	0.94	0.65	0.81	0.72	0.59
Moisture %	4.60	4.69	4.72	4.67	4.95	4.76
Cu ppm	2000	2200	1900	2160	2120	2160
Pb ppm	130	160	90	155	150	150
Zn ppm	1900	2000	1900	2000	1800	2000
Cd ppm	7	8	5	7	8	8
Co ppm	260	220	260	250	260	240
Ni ppm	44	50	40	51	53	54
As ppm	7	12	5	14	13	11
Pt ppb	10	10	<10	<10	<10	<10
Pd ppb	12	5	1	2	90	7
Au ppb	255	236	164	282	264	273

April 20/88

SIGNED _____

CTA

For enquiries on this report, please contact Customer Service Department.
Samples, Pulps and Rejects discarded two months from the date of this report.

TECHNICAL SERVICE LABORATORIES
1301 FEWSTER DRIVE. MISSISSAUGA. ONTARIO L4W 1A2
TELEPHONE : (416) 625 - 1544

CERTIFICATE OF ANALYSIS

CANMET - MSL Division
555 BOOTH ST.
OTTAWA ONT.
K1A 0G1
YOUR REFERENCE- ATTN: C.W. SMITH

T.S.L. REPORT No. : T - 4442
T.S.L. File No. : 09FEB
T.S.L. Invoice No. :

SAMPLE #	SiO2	Al2O3	Fe2O3	CaO	MgO	Na2O	K2O	TiO2	MnO	P2O5	Ba	Sr	Zr	LOI	TOTAL
	%	%	%	%	%	%	%	%	%	%	ppm	ppm	ppm		
RTS3-A	35.08	9.21	33.05	3.17	4.06	.71	.40	.57	.26	.11	95	47	70	11.88	98.53
RTS3-B	36.06	9.52	32.11	3.23	4.17	.73	.38	.58	.27	.11	90	47	70	11.80	98.99
RTS3-C	35.45	9.35	32.34	3.18	4.09	.72	.43	.57	.26	.12	90	48	72	11.84	98.38
RTS3-D	35.58	9.48	32.41	3.23	4.15	.71	.36	.58	.27	.11	92	46	70	11.82	98.73
RTS3-E	35.84	9.42	32.54	3.21	4.14	.73	.46	.58	.27	.11	92	47	70	11.73	99.06
RTS3-F	36.10	9.58	32.11	3.23	4.20	.72	.38	.59	.27	.10	90	47	71	11.80	99.11

DATE : 09-FEB-1988

SIGNED : _____
Adrian H. Debnam Ph.D.

TECHNICAL SERVICE LABORATORIES
DIVISION OF BURGENER TECHNICAL ENTERPRISES LIMITED
1301 FEWSTER DRIVE
MISSISSAUGA, ONTARIO
L4W 1A2
(416) 625-1544 FAX: (416) 625-8368

CERTIFICATE OF ANALYSIS

SAMPLE(S) FROM

Canmet - MSL Division
555 Booth Street
Ottawa, Ontario
K1A 0G1
Attn: Dr. C.W. Smith

REPORT No.
T-4443

SAMPLE(S) OF

REFERENCE ORE TAILINGS

CANMET ORE TAILINGS	RTS-4 A	RTS-4 B	RTS-4 C	RTS-4 D	RTS-4 E	RTS-4 F
Si %	1.02	1.02	1.03	1.03	0.97	0.97
Fe %	56.77	56.78	56.79	56.64	56.42	56.45
Ca %	0.27	0.27	0.28	0.29	0.29	0.28
Mg %	0.20	0.19	0.20	0.18	0.18	0.18
Al %	0.37	0.34	0.35	0.35	0.33	0.33
S %	30.20	25.77	29.21	29.95	29.94	31.64
SO4 %	0.87	0.90	0.84	0.93	1.08	0.99
CO2%	1.09	1.24	0.65	0.37	0.29	0.28
Moisture %	0.68	0.65	0.62	0.61	0.65	0.58
Cu ppm	185	185	195	190	195	200
Pb ppm	50	60	65	65	60	50
Zn ppm	130	130	130	120	120	130
Cd ppm	<1	<1	<1	<1	<1	<1
Co ppm	240	245	240	240	250	240
Ni ppm	8000	7900	7800	7800	7800	7900
As ppm	59	58	58	54	52	52
Pt ppb	120	240	60	120	80	40
Pd ppb	30	100	50	45	100	80
Au ppb	33	76	33	33	33	25

April 20/88

SIGNED _____

CTA

For enquiries on this report, please contact Customer Service Department.
Samples, Pulps and Rejects discarded two months from the date of this report.

TECHNICAL SERVICE LABORATORIES
1301 FEWSTER DRIVE. MISSISSAUGA. ONTARIO L4W 1A2
TELEPHONE : (416) 625 - 1544

CERTIFICATE OF ANALYSIS

CANMET - MSL Division
555 BOOTH ST.
OTTAWA ONT.
K1A 0G1
YOUR REFERENCE- ATTN: C.W. SMITH

T.S.L. REPORT No. : T - 4443
T.S.L. File No. : 09FEB
T.S.L. Invoice No. :

SAMPLE #	SiO2 %	Al2O3 %	Fe2O3 %	CaO %	MgO %	Na2O %	K2O %	TiO2 %	MnO %	P2O5 %	Ba ppm	Sr ppm	Zr ppm	LOI	TOTAL
RTS4-A	2.19	.70	81.17	.38	.33	.06	< .10	.15	.03	< .01	19	11	10	13.74	98.76
RTS4-B	2.19	.65	81.18	.38	.32	.06	< .10	.15	.03	< .01	22	13	12	13.76	98.72
RTS4-C	2.20	.66	81.20	.39	.33	.12	< .10	.15	.03	< .01	27	16	13	13.26	98.34
RTS4-D	2.21	.66	80.98	.41	.30	.07	< .10	.14	.03	< .01	22	14	< 10	13.48	98.31
RTS4-E	2.08	.62	80.67	.41	.30	.07	< .10	.14	.03	< .01	30	17	10	13.57	97.91
RTS4-F	2.09	.61	80.71	.39	.29	.05	< .10	.14	.03	< .01	24	13	11	13.54	97.88

DATE : 08-FEB-1988

SIGNED : _____
Adrian H. Debnam Ph.D.